



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,343	02/05/2002	George P. Vella-Coleiro	1052.001	7673
22186	7590	08/18/2005	EXAMINER	
MENDELSON AND ASSOCIATES, P.C. 1500 JOHN F. KENNEDY BLVD., SUITE 405 PHILADELPHIA, PA 19102			KUMAR, PANKAJ	
			ART UNIT	PAPER NUMBER
			2631	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,343

Applicant(s)

VELLA-COLEIRO, GEORGE P.

Examiner

Pankaj Kumar

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,7-10,15,16 and 21-25 is/are rejected.
- 7) ☒ Claim(s) 3-6,11-14 and 17-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it should not contain the title of the invention. Correction is required. See MPEP § 608.01(b).

Double Patenting

(Note: This double patenting section is primarily from 10/153,446 with a few modifications)

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993)*, *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985)*, *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982)', *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970)', and, *In re Thonhgtton*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969). A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b). . Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Art Unit: 2631

3. Claims 1, 15, and 25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of copending Application No. 10/730419 (US 2004/0264597).

4. As to claims 1, 15, and 25 of the instant application, the limitations of claims 1, 15, and 25 of the instant application is recited in claims 1 and 2 of the copending application except that the copending application includes limitations for generating a first frequency dependent predistortion signal corresponding to a first set of frequency components for the input signal', generating a second frequency dependent predistortion signal corresponding to a second set of frequency components', and combining the first and second frequency dependent predistortion signals to generate the predistorted signal. It would have been obvious to one of ordinary skill in the art at the time of invention to remove the recited steps in order to simplify the method and/or apparatus.

5. Claims 7 and 13 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of copending.

6. As to claims 7 and 13 of the instant application, the limitations of claims 7 and 13 of the instant application is recited in claim 8 of the copending application except that the copending application includes limitations for generating a first frequency dependent predistortion signal corresponding to a first set of frequency components for the input 'signal', generating a second frequency dependent predistortion signal corresponding to a second set of frequency components', and combining the first and second frequency dependent predistortion signals to generate the predistorted signal, wherein the first and second predistortion signals are generated

Art Unit: 2631

in a digital domain. It would have been obvious to one of ordinary skill in the art at the time of invention to remove the recited steps in order to simplify the method and/ or apparatus.

7. Claims 1 , 15, and 25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of copending Application No. 10/217930 (US 2003/0227981).

8. As to claims 1 , 15, and 25 of the instant application, the limitations of claims 1, 15, and 25 of the instant application is recited in claim 1 of the copending application except that the copending application includes limitations for generating one or more waveforms corresponding to one or more predistortion parameters; differentiating the one or more waveforms with respect to time to generate one or more differential ' waveforms', and applying the one or more differential waveforms to the input signal to generate the predistorted signal. It would have been obvious to one of ordinary skill in the art at the time of invention to remove the recited steps in order to simplify the method and/or apparatus.

9. Claims 7 and 13 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of copending

10. As to claims 7 and 13 of the instant application, the limitations of claims 7 and 13 of the instant application is recited in claim 8 of the copending application except that the copending application includes limitations for generating one or more waveforms corresponding to one or more predistortion parameters, differentiating the one or more waveforms with respect to time to generate one or more differential waveforms', and applying the one or more differential waveforms to the input signal to generate the predistorted signal. It would have been obvious to

Art Unit: 2631

one of ordinary skill in the art at the time of invention to remove the recited steps in order to simplify the method and/or apparatus.

11. Claims 9 and 23 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of copending Application No. 10/217930 (US 2003/0)27981).

12. As to claims 9 and 23 of the instant application, the limitations of claims 9 and 23 of the instant application is recited in claim 3 of the copending application except that the copending application includes limitations for generating one or more waveforms corresponding to one or more predistortion parameters; differentiating the one or more waveforms with respect to time to generate one or more differential waveforms, and applying the one or more differential waveforms to the input signal to generate the predistorted signal. It would have been obvious to one of ordinary skill in the art at the time of invention to remove the recited steps in order to simplify the method and/or apparatus.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1, 2, 8, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews 4,890,300 in view of Blauvelt USPN 6,288,814. Here is how the references teach the claims:

Art Unit: 2631

15. As per claim 1: A method for reducing spurious emissions in an amplified signal, comprising the steps of: (a) receiving an input signal (Andrews fig. 1: 2, 4); and (b) applying frequency-dependent (Andrews fig. 1: 8, 10, 12) phase pre-distortion (Andrews fig. 4: 40; if this is not sufficient then Blauvelt teaches retarding phase of the predistortion based on frequency in col. 11 lines 8-10; it would be obvious to combine because as explained below) to the input signal to generate a pre-distorted output signal (Andrews fig. 1: output of 8, 10, 12; fig. 4: output of 40), such that, when the pre-distorted output signal is applied to an amplifier to generate the amplified signal (Andrews fig. 1: 20), the frequency-dependent phase pre-distortion reduces spurious emissions in the amplified signal (Andrews fig. 1: by 16 choosing either 8, 10, or 12, the other two that are not chosen are spurious emissions which are reduced by not being chosen).

16. Andrews teaches frequency dependent (Andrews fig. 1: 8, 10, 12) phase pre-distortion (Andrews fig. 4: 40). However, if this is not sufficient, then Blauvelt teaches retarding phase of the predistortion based on frequency in col. 11 lines 8-10. Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at frequency dependent phase pre-distortion as recited by the instant claims, because the combined teaching of Andrews with Blauvelt suggest frequency dependent phase pre-distortion as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Andrews with Blauvelt because Andrews suggests frequencies and phase pre-distortion (something broad) in general and Blauvelt suggests the beneficial use of frequency dependent phase pre-distortion such as to compensate for the delay corresponding to a greater fraction of a cycle at higher frequencies in the analogous art of pre-distortion.

Art Unit: 2631

17. As per claim 2: The invention of claim 1, wherein step (b) comprises the steps of: (1) generating a main output signal from the input signal (Andrews fig. 1: main is out of 20 from input of 2, 4); (2) generating one or more frequency-dependent phase pre-distortion signals from the input signal (Andrews fig. 1: 8, 10, 12; fig. 4: 40); and Andrews does not teach (3) advancing or delaying each frequency-dependent phase pre-distortion signal relative to the main output signal; and (4) combining each advanced or delayed frequency-dependent phase pre-distortion signal with the main output signal to generate the pre-distorted output signal. Blauvelt teaches (3) advancing or delaying each frequency-dependent phase pre-distortion signal relative to the main output signal (Blauvelt teaches this in fig. 8: delay.); and (4) combining each advanced or delayed frequency-dependent phase pre-distortion signal with the main output signal to generate the pre-distorted output signal (Blauvelt fig. 8: combining after the delay).

18. As per claim 8: The invention of claim 1, wherein the input signal is an RF signal and the frequency dependent phase pre-distortion is applied in the RF domain (Andrews fig. 1: 4 RF).

19. Claim 15 is discussed above with respect to claim 1.

20. Claim 16 is discussed above with respect to claim 2.

21. Claims 7, 9, 10, 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews 4,890,300 in view of Blauvelt USPN 6,288,814 as applied to claim 1 above, and further in view of Kim USPN 6,903,604. Here is how the references teach the claims:

22. As per claim 7: The invention of claim 1, wherein the input signal is a baseband signal and the frequency-dependent phase pre-distortion is applied in the baseband domain (not in Andrews but would be obvious as explained below). Andrews does not teach that the input

Art Unit: 2631

signal is a baseband signal and the frequency-dependent phase pre-distortion is applied in the baseband domain. Kim 6903604 teaches that the input signal is a baseband signal and the frequency-dependent phase pre-distortion is applied in the baseband domain (Kim fig. 1 with predistortion 20 in baseband.). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the input signal is a baseband signal and the frequency-dependent phase pre-distortion is applied in the baseband domain as recited by the instant claims, because the combined teaching of Andrews with Kim suggest input signal is a baseband signal and the frequency-dependent phase pre-distortion is applied in the baseband domain as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Andrews with Kim because Andrews suggests low range (Andrews fig. 1: 8) (something broad) in general and Kim suggests the beneficial use of low-range being low enough to be at baseband such as to estimate amplitude characteristics and update calculation of pre-distortion (Kim fig. 1: 25, 15) in the analogous art of pre-distortion.

23. As per claim 9: The invention of claim 1, wherein the frequency dependent phase pre-distortion is based on data retrieved from one or more look-up tables (not in Andrews but would be obvious as explained below). Andrews does not teach wherein the frequency dependent phase pre-distortion is based on data retrieved from one or more look-up tables. Kim teaches wherein the frequency dependent phase pre-distortion is based on data retrieved from one or more look-up tables (Kim col. 2 lines 17-20). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the frequency dependent phase pre-distortion is based on data retrieved from one or more look-up tables as recited by the instant claims, because the combined teaching of Andrews with Kim suggest the frequency

Art Unit: 2631

dependent phase pre-distortion is based on data retrieved from one or more look-up tables as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Andrews with Kim because Andrews suggests predistortion (something broad) in general and Kim suggests the beneficial use of predistortion using a table such as the practice being typical in the analogous art of predistortion.

24. As per claim 10: The invention of claim 9, wherein the one or more look-up tables are adaptively updated according to control signals generated based on the amplified signal (not in Andrews but would be obvious as explained below). Andrews does not teach wherein the one or more look-up tables are adaptively updated according to control signals generated based on the amplified signal. Kim teaches wherein the one or more look-up tables are adaptively updated according to control signals generated based on the amplified signal (Kim col. 2 lines 17-31). Thus, it would have been obvious, to one of ordinary skill in the art, at time the invention was made, to arrive at the one or more look-up tables are adaptively updated according to control signals generated based on the amplified signal as recited by the instant claims, because the combined teaching of Andrews with Kim suggest one or more look-up tables are adaptively updated according to control signals generated based on the amplified signal as recited by the instant claims. Furthermore, one of ordinary skill in the art, would have been motivated to combine the teachings of Andrews with Kim because Andrews suggests pre-distortion (something broad) in general and Kim suggests the beneficial use of adaptively updating pre-distortion tables such as the practice being typical in the analogous art of predistortion.

25. Claim 21 is discussed above with respect to claim 7.

Art Unit: 2631

26. As per claim 22: The invention of claim 15, wherein the input signal is an RF signal and the apparatus applies the frequency-dependent phase pre-distortion in the RF domain (Andrews fig. 1: 4 RF).

27. Claim 23 is discussed above with respect to claim 9.

28. Claim 24 is discussed above with respect to claim 10.

29. As per claim 25, it is discussed above with respect to claim 10. Also, the limitations in the preamble which are not the same as the ones in the body are not afforded patentable weight since these recitations occur in the preamble and recite the intended use of a structure and the body of the claim does not depend on the preamble for completeness and the bodily limitations are able to stand alone.

Allowable Subject Matter

30. Claims 3-6, 11-14, 17-20 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2631

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (571) 272-3011. The examiner can normally be reached on Mon, Tues, Thurs and Fri after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Pankaj Kumar
Patent Examiner
Art Unit 2631

PK